AMENDMENT TO THE CLAIMS

1. Cancelled

2. (Currently Amended) The system of claim ~~1~~71 wherein said plurality of sensors are sensitive to said detected magnitude of forces oriented perpendicular to said plurality of sensors.

3. (Currently Amended) The system of claim ~~1~~71 wherein said plurality of sensors are sensitive to said detected magnitude of forces oriented parallel to said plurality of sensors.

4. (Currently Amended) The system of claim ~~1~~71 wherein said plurality of sensors are sensitive to said detected magnitude of forces oriented parallel to said plurality of sensors and forces oriented perpendicular to said plurality of sensors.

5. (Currently Amended) The system of claim ~~1~~71 wherein said layer with said plurality of sensors are mounted in a shoe.

6. (Currently Amended) The system of claim ~~1~~71, wherein said layer with said plurality of sensors are mounted in a stocking.

7. (Currently Amended) The system of claim ~~1~~71, wherein said layer with said plurality of sensors are mounted in a sandal.

8. (Currently Amended) The system of claim ~~1~~71, wherein said layer with said plurality of sensors are insertable into a shoe.

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9. (Currently Amended) The system of claim ~~1~~71, wherein said layer with said plurality of sensors are insertable into a stocking.

10. (Currently Amended) The system of claim ~~1~~71, wherein said layer with said plurality of sensors are insertable into a sandal.

11.-14. Cancelled

15. (Currently Amended) The system of claim ~~1~~71, wherein said signal processing subsystem is further operable to:

convert said at least one balance information signal into at least one estimate of a position of force applied to a sole of said at least one foot; and

wherein said ~~at least one stimulation control signal~~ balance control signals encode~~s~~ said position of force applied to ~~said~~ a sole of said ~~at least one~~user's foot.

16. (Currently Amended) The system of claim ~~1~~71 wherein said signal processing subsystem is further operable to:

convert said ~~at least one~~ balance information signal~~s~~ into ~~at least one~~an estimate of an orientation of force applied to a sole of said ~~at least one~~user's foot; and

wherein said ~~at least one stimulation~~balance control signal~~s~~ encodes said orientation of force applied to ~~said~~ a sole of said ~~at least one~~user's foot.

17. (Currently Amended) The system of claim ~~1~~71, wherein the signal processing subsystem is further operable to:

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convert said at least one balance information signal into at least one estimate of a portion of a total body weight of said user applied to a sole of said ~~at least one~~user's foot and;

wherein said at least one stimulation control signal encodes said portion of said total body weight of said user applied to said sole ~~of said at least one foot~~.

18. (Currently Amended) The system of claim ~~1~~71, wherein said signal processing subsystem is further operable to:

determine a magnitude of a resultant reaction force applied to a sole of said ~~at least one~~user's foot by

calculating a sum equal to the total force applied to all sensors within said plurality of sensors, and

dividing said sum by a total body weight of said user.

19. (Currently Amended) The system of claim ~~1~~71, wherein a plurality of ~~said at least one~~ stimulators comprises an array of stimulators adapted to be secured~~able~~ to a leg of said user.

20. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators comprise~~s~~ an array of stimulators adapted for incorporation~~ed~~ into a stocking.

21. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators comprise~~s~~ at least one stimulator adapted to be implantable into ~~skin of~~ said user's skin.

22.-24. (Cancelled)

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25. (Currently Amended) The system of claim ~~1~~71 wherein said ~~at least one~~ stimulators ~~is operable~~are adapted to produce vibrational stimuli to said user's skin.

26. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators ~~is~~ are operable to produce electrical stimuli to said user's skin.

27. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators ~~is~~ are operable to produce electrocutaneous stimuli to said user's skin.

28.-29. Cancelled

30. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators ~~is~~ are operable to produce thermal stimuli to said user's skin.

31. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators ~~is~~ are configured for placement on the skin of at least one leg of said user.

32. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators ~~is~~ are configured for placement on ~~the~~ trunk skin of said user.

33. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators ~~is~~ are configured for placement on ~~the~~ head skin of said user.

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34. (Currently Amended) The system of claim ~~1~~71, wherein said ~~at least one~~ stimulators ~~includes~~ are formed in an array of stimulators configured to be mountable proximate to a leg of said user in a plane substantially parallel to a plane of an ipsilateral foot sole.

35. (Currently Amended) The system of claim ~~1~~71 wherein said ~~at least one~~ stimulators ~~is operable~~are configured to stimulate a sole of said ~~at least one~~user's foot.

36. (Currently Amended) The system of claim ~~1~~71 wherein said ~~at least one~~ stimulators ~~is~~ are responsive to said ~~received at least one stimulation~~balance control signal such that at least one stimulus characteristic selected from the group comprising amplitude, frequency, and location ~~is indicative of at least one parameter describing~~correlates to forces applied to ~~a sole of~~ said ~~at least one~~user's foot.

37. (Currently Amended) The system of claim ~~1~~71, further comprising:

at least one sensor of said plurality of sensors is adapted for sensing ~~for transducing~~ an angle between at least one foot and the ipsilateral lower leg, and for transmitting an ankle angle signal to said signal processing subsystem representation thereof; and

wherein said signal processing subsystem receives said ankle angle signal, and ~~determines~~ provides said ~~at least one~~

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stimulation control signals, ~~at least in part,~~ responsive to said ankle angle signal.

38. (Currently Amended) The system of claim ~~1~~71, further comprising:

at least one sensor of said plurality of sensors is adapted for sensing ~~for transducing~~ an angle between at least one lower leg and the ipsilateral upper leg of said user, and for transmitting a knee angle signal representation thereof to said signal processing subsystem; and

wherein said signal processing subsystem receives said knee angle signal, ~~and determines said at least one~~provides said stimulation control signal, ~~at least in part,~~ responsive to said knee angle signal.

39.-70. Cancelled

71. (New) A system for assisting the maintenance of balance over time during standing and gait of a user comprising:

a sensing layer adapted for user wearing under a user's foot during conditions of standing and gait, said layer having a plurality of sensors positioned for sensing two dimensional force distribution under said user's foot;

excitation means for said sensors which, during user standing and gait, provide signals representing user balance information as a function of said two dimensional force distribution over time;

said sensing layer adapted to transmit said balance information signals to a remote location under conditions of standing and gait;

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a signal processing subsystem at said remote location and adapted to be user wearable, said subsystem configured to receive said balance information signals and to provide in response thereto balance control signals containing temporal and spatial information reflecting said force distribution for use in user skin stimulation;

an array of a plurality of stimulators adapted for attachment in contact with a skin area of said user; and

said plurality of stimulators arranged in a two dimensional array and responsive to said balance control signals to provide skin stimulation to said user in a form reflecting said two dimensional force distribution under said user's foot both spatially and temporally in said two dimensional force distribution over time, both under conditions of standing and gait, to thereby provide feedback to the user via the array of plural stimulators to provide individualized spatial mapping and temporal information to allow complex, multi-dimensional and time varying corrective action.

72. (New) A system for assisting the maintenance of balance over time during standing and gait of a user comprising:

a sensing layer adapted for user wearing under a user's foot during conditions of standing and gait, said layer having a plurality of sensors positioned for sensing two dimensional force distribution under said user's foot;

excitation means for said sensors which, during user standing and gait, provide signals representing user balance information as a function of said two dimensional force distribution over time;

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said sensing layer adapted to transmit said balance information signals to a remote location under conditions of standing and gait;

a signal processing subsystem at said remote location and adapted to be user wearable, said subsystem configured to receive said balance information signals and to provide in response thereto balance control signals containing temporal and spatial information reflecting said force distribution for use in user skin stimulation;

an array of a plurality of stimulators adapted for attachment in contact with a skin area of said user;

said stimulators arranged in plural vertically separated horizontal rows; and

said plurality of stimulators responsive to said balance control signals to provide skin stimulation to said user in a form reflecting said two dimensional force distribution under said user's foot both spatially and temporally in said balance control signals to provide skin stimulation to said user reflecting said two dimensional force distribution changes over time both under conditions of standing and gait, to thereby provide feedback to the user via the array of plural stimulators to provide individualized spatial mapping and temporal information to allow complex, multi-dimensional and time varying corrective action.

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